UNIT INSTRUCTIONS

TD-104
4th EDITION, 1 MAY 1960

HIGH-VOLTAGE POWER SUPPLY

428B-1

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1.1 APPLICATION AND DESCRIPTION.

The High - Voltage Power Supply 428B-1 supplies 2000 volts d-c at 500 ma and 400 volts d-c at 80 ma for a power amplifier. The unit consists of two bridge rectifiers, protective fuses, and an interlock switch. The main chassis is constructed for mounting in a standard 19-inch, open-type rack. The cover, secured by thumb-release fasteners, protects the equipment and protects personnel from high voltage.

1.2 TECHNICAL CHARACTERISTICS.

Weight:	93 pounds
Size:	15-3/4 inches high, 19 inches wide, 7 inches deep
Voltage input:	115/230 volts, a-c, single phase, 60 cycles
Power input:	1245 watts
Power output:	2000 volts d-c at 600 ma maximum; 400 volts d-c at 80 ma maximum
Warmup period:	None

1.3 SEMICONDUCTOR AND FUSE COMPLEMENT.

Table 1 lists all semiconductors and fuses used in the High-Voltage Power Supply 428B-1. Reference symbols, types, and functions are also listed.

TABLE 1
SEMICONDUCTOR AND FUSE COMPLEMENT

SYMBOL	TYPE	FUNCTION
CR1 thru CR12	1N1084	400-volt rectifiers
CR13 thru CR44	1N1084	2000-volt rectifiers
F1	20/10A	Line protection
F2	3/8	Rectifier protection
F3	1A	H-v rectifier protection

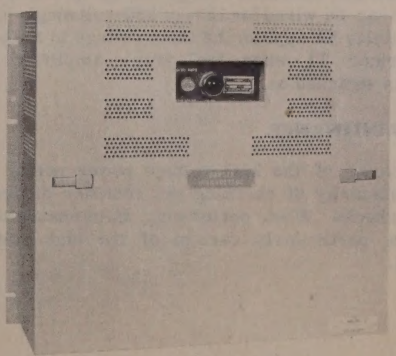

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Figure 1. High-Voltage Power Supply 428B-1

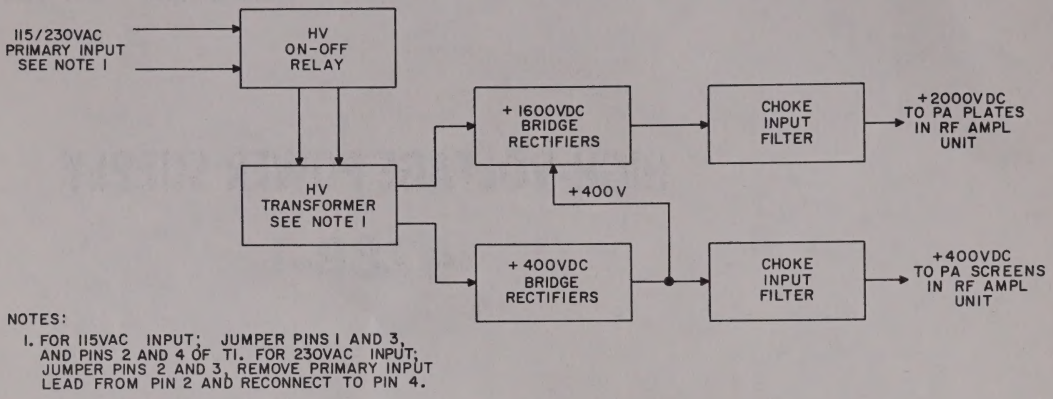

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Figure 2. High-Voltage Power Supply 428B-1, Block Diagram

2.1 CIRCUIT DESCRIPTION.

Figure 2 is a block diagram of High-Voltage Power Supply 428B-1. The input voltage is applied to the high voltage transformer T1 through the high voltage relay K1. The output of the transformer is coupled to the two rectifier bridges which are connected in series to provide 2000- and 400-volt d-c output. Figure 5 is a schematic diagram of the power supply. The 400-volt d-c supply consists of CR1 through CR12 connected in a conventional full-wave bridge rectifier circuit. The output is fused by F2 and filtered by inductor L2 and resistor R1. The 400-volt is connected to the power amplifier through the junction box. The 2000-volt d-c supply consists of CR13 through CR44, connected in a conventional full-wave bridge rectifier circuit. The output is filtered by L1, C1, and C2. Fuse F3 protects the circuit and resistors R2, R3, and R4 are bleeders. As shown on the schematic diagram, the power transformer can be wired for 155- or 230-volt single-phase input. Relay K1 applies the input voltage to the power transformer T1 when the power amplifier plate power is switched on.

3.1 MAINTENANCE.

Maintenance of the high voltage power supply consists primariiy of checking the rectifier diodes and visual checks. When performing maintenance on the unit, be particularly careful of the high voltages present.

WARNING

Voltages dangerous to life (2000 v d-c) are present throughout the high voltage power supply, and no attempt should be made to service the unit with the power applied. All capacitors in the unit should be discharged with a high voltage shorting rod before touching any of the components.

3.1.1 TEST EQUIPMENT REQUIRED.

The only test equipment required to maintain the high voltage power supply is a Vacuum Tube Voltmeter Hewlett-Packard 410B.

3.1.2 TROUBLE ISOLATION.

The most likely trouble to occur in the High-Voltage Power Supply 428B-1 is a blown fuse. If trouble is suspected in the rectifiers, the diode forward resistance and reverse resistance may be checked with a Hewlett-Packard 410B. The resistance, using the RX1 scale, should be as follows:

Forward - Approximately 5 ohms
Reverse - Infinite

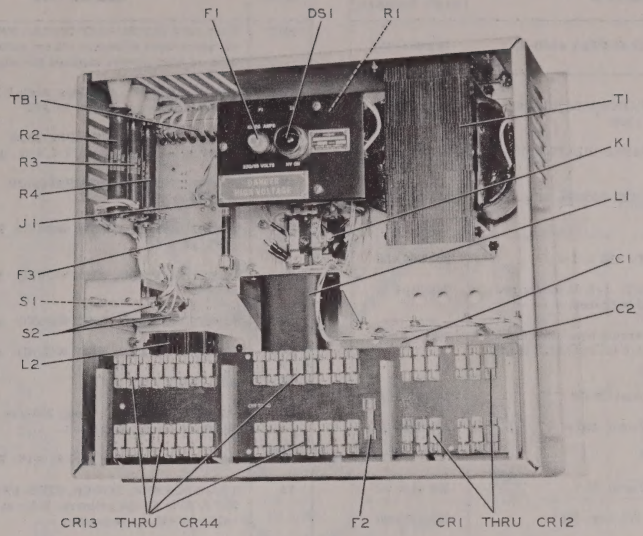

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Figure 3. High-Voltage Power Supply 428B-1, Front View, Cover Removed

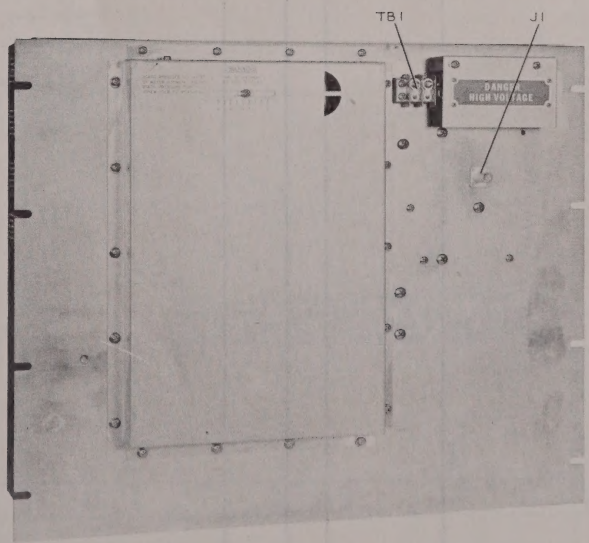

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Figure 4. High-Voltage Power Supply 428G-1, Rear View

PARTS LIST

ITEM	DESCRIPTION	COLLINS PART NUMBER
	HIGH-VOLTAGE POWER SUPPLY 428B-1	522-0863-006
C1	CAPACITOR, FIXED, PAPER DIELECTRIC: 3,000 vdc working; 4 uf ±20%	930-4340-00
C2	CAPACITOR, FIXED, PAPER DIELECTRIC: same as C1	930-4340-00
CR1 thru CR44	SEMICONDUCTOR DEVICE, DIODE: silicon; type 1N1084	353-1567-00
DS1	LAMP, INCANDESCENT: 120 v, 6 w	262-0041-00
DS2	LENS, INDICATOR LIGHT: 1-9/64 in. dia red w/smooth and frosted on back lens	262-0104-00
E1	CLIP, ELECTRICAL: ferrule type; phosphor bronze; accommodates 3/8 in. and 13/32 in. dia fuse	265-4010-00
E2	CLIP, ELECTRICAL: same as E1	265-4010-00
F1	FUSE, CARTRIDGE: 10 amp, 250 v	264-0003-00
	OR	
F1	FUSE, CARTRIDGE: 20 amp, 25 v	264-4160-00
F2	FUSE, CARTRIDGE: 0.375 amp, 250 v	264-4021-00
F3	FUSE, CARTRIDGE: 1 amp, 2500 v	264-0252-00
J1	CONNECTOR, RECEPTACLE, ELECTRICAL: 1 rd male contact; 5000 v, 5 amps; straight	357-9318-00
K1	RELAY, ARMATURE: dpst; 15 amp at 115 v ac; 1 inductive winding, 15 v ac	401-1194-00
L1	REACTOR: 1 coil, 8 hy, 500 ma dc, 100 ohms dc	668-0280-00
L2	REACTOR: 1 coil, 12 hy, 105 ma dc, 204 ohms dc	668-0281-00

ITEM	DESCRIPTION	COLLINS PART NUMBER
MP1	BAR, ACTUATOR, ELECTRICAL SWITCH: stainless steel w/bronze roller; rectangular; two 2-56 rd head screws supplied for mtg; P/O S2	260-0945-00
MP2	SHAFT, SWITCH: stainless steel; 0.250 in. dia by 6-1/8 in. lg; undercut; P/O S2	543-1446-002
MP3	SPRING, HELICAL, COMPRESSION: steel wire; 17/64 in. id, 0.319 in. od, 1-1/8 in. lg; P/O S2	543-1448-002
MP4	SPRING, HELICAL, COMPRESSION: same as MP3; P/O S2	543-1448-002
R1	RESISTOR, FIXED, WIRE WOUND: 22,000 ohms ±10%; 25 w	710-0373-00
R2	RESISTOR, FIXED, WIRE WOUND: 18,000 ohms ±5%; 55 w	747-2772-00
R3	RESISTOR, FIXED, WIRE WOUND: same as R2	747-2772-00
R4	RESISTOR, FIXED, WIRE WOUND: same as R2	747-2772-00
RV1	NOT USED	
S1	SWITCH, SENSITIVE: spdt, 250 v ac at 5 amp, 30 vdc at 4 amp; P/O S2	266-3105-00
S2	SWITCH, SHORTING: incl S1 MP1, 2, 3, & 4	543-1460-003
T1	TRANSFORMER, POWER, STEP-UP: 115 v, 230 v, 50 to 60 cps primary; 460 v at 540 ma, 1825 v at 440 ma secondary	662-0279-00
TB1	TERMINAL BOARD: phenolic; incl 10 screw-type terminals	367-0569-00
TB2	TERMINAL BOARD: 18 solder lug terminals, 7 stud terminals, 90 electrical clips	543-1465-004
XDS1	LAMPHOLDER: accommodates double contact candelabra bayonent base bulb	262-0103-00
XF1	FUSEHOLDER: 25 v, 20 amp; accommodates one cartridge fuse	265-1040-00

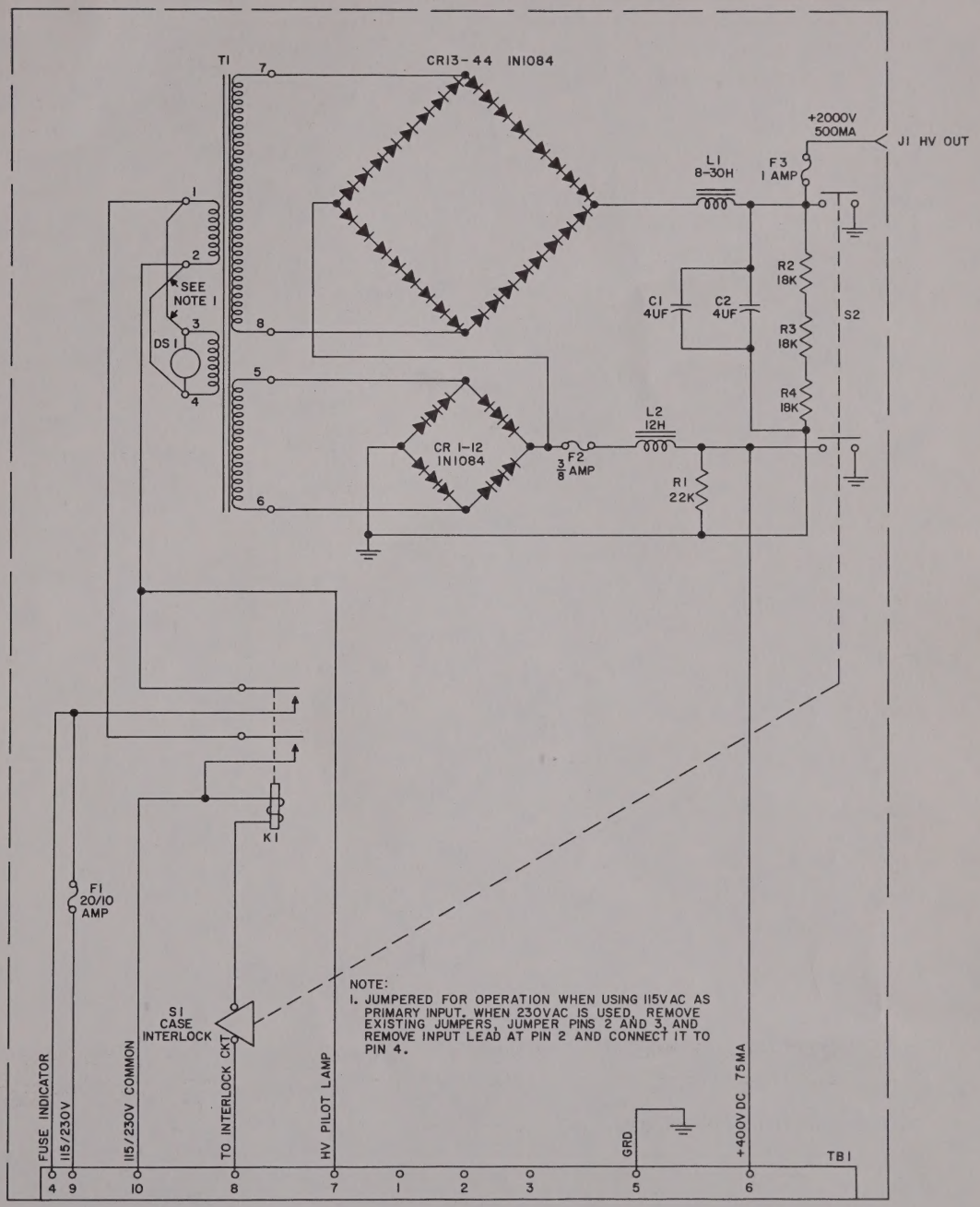

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Figure 5. High-Voltage Power Supply 428B-1, Schematic Diagram